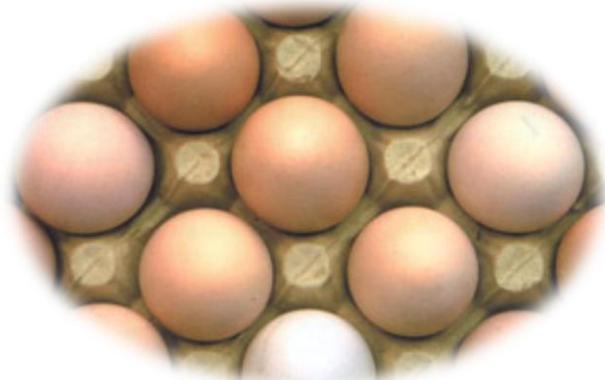




Telur

Titis Sari Kusuma

MACAM TELUR



- Telur ayam kampung (Buras)

- Telur ayam negeri (Ras)



MACAM TELUR

- Telur Puyuh



- Telur Bebek



PERBEDAAN BENTUK



TELUR

- Nilai gizi telur sangat lengkap,
- sumber protein yang baik,
 - kadarnya sekitar 14%, >> tiap butir telur akan diperoleh sekitar 8 gram protein.
- Kandungan asam amino sangat lengkap,
 - sehingga protein telur seringkali dijadikan sebagai protein “referensi”

SIFAT FUNGSIONAL

DAYA KOAGULASI

- Kelarutan
- Bentuk cair jadi padat
- Perubahan struktur molekul protein :
 - Panas
 - Mekanik
 - Asam basa
 - Garam
- Irreversible : 60-70°C

DAYA BUIH (FORMING)

- Dispersi koloid gas dalam cairan
- Putih telur kocok, udara terperangkap dalam putih telur >> Kaku (Hilang sifat alir)
- Kestabilan buih >> Ovomusin



Daya Emulsi/Emulsifying Properties

- campuran antara dua jenis cairan yang secara normal tidak dapat bercampur, dimana salah satu fase terdispersi dalam fase pendispersi.
- Kuning telur >>> emulsi minyak dalam air.
- Kuning telur mengandung minyak yang bersifat surface active yaitu lesitin, kolesterol dan lesitoprotein.
- Lesitin mendukung terbentuknya emulsi minyak dalam dalam air, sedangkan kolesterol cenderung untuk membentuk emulsi air dalam minyak.

Kontrol Kristalisasi



- Penambahan albumin ke dalam larutan gula dapat mencegah terbentuknya gula (kristal).
- albumin >> cegah penguapan >> cegah inversi sukrosa berlebihan.
- Manfaat >> dalam pembuatan gula-gula >> rasa di mulut manis, halus serta selalu basah.

Pewarna

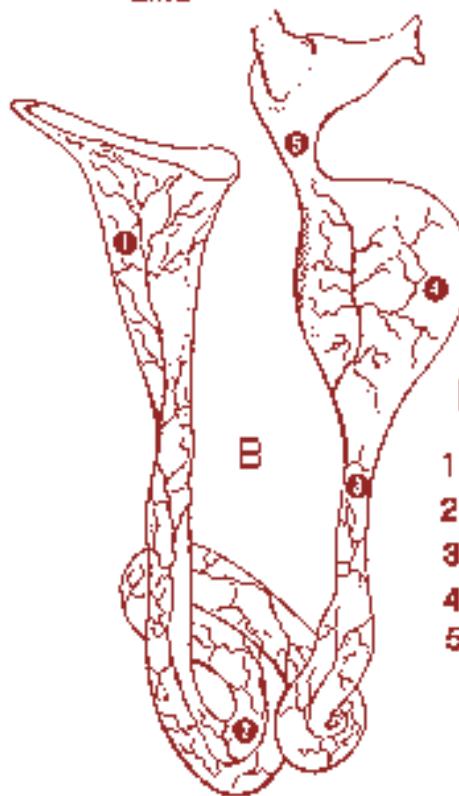


- Sifat ini hanya dimiliki oleh kuning telur.
- Pigmen kuning pada telur adalah xantofil, lutein, beta karoten dan kriptoxantin.
- Sifat ini banyak dimanfaatkan pada industri pembuatan es krim, custard dan saus

STRUKTUR TELUR

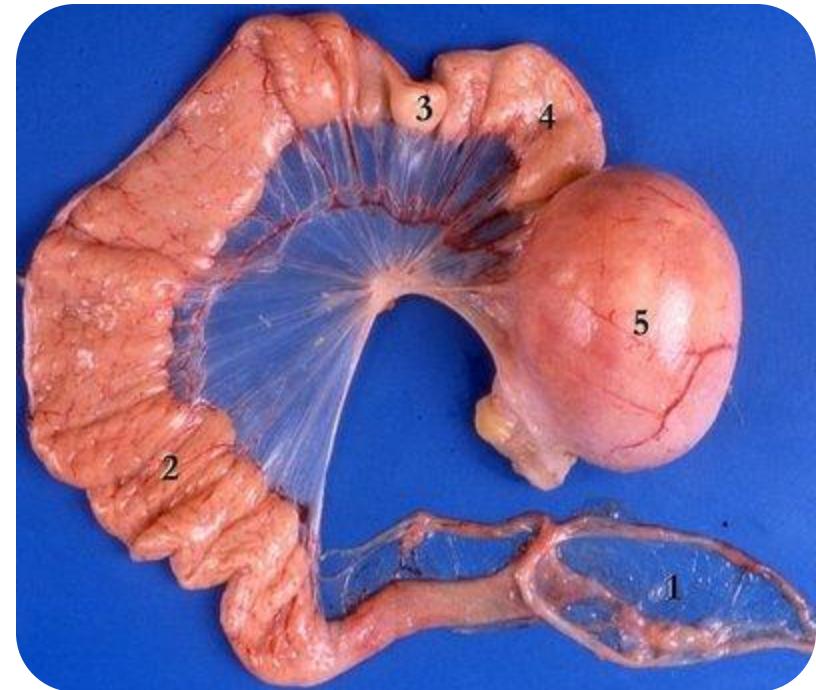
A OVARY

- 1 Mature Yolk within Yolk Sac
- 2 Immature Yolk
- 3 Empty Follicle
- 4 Stigma or Suture Line



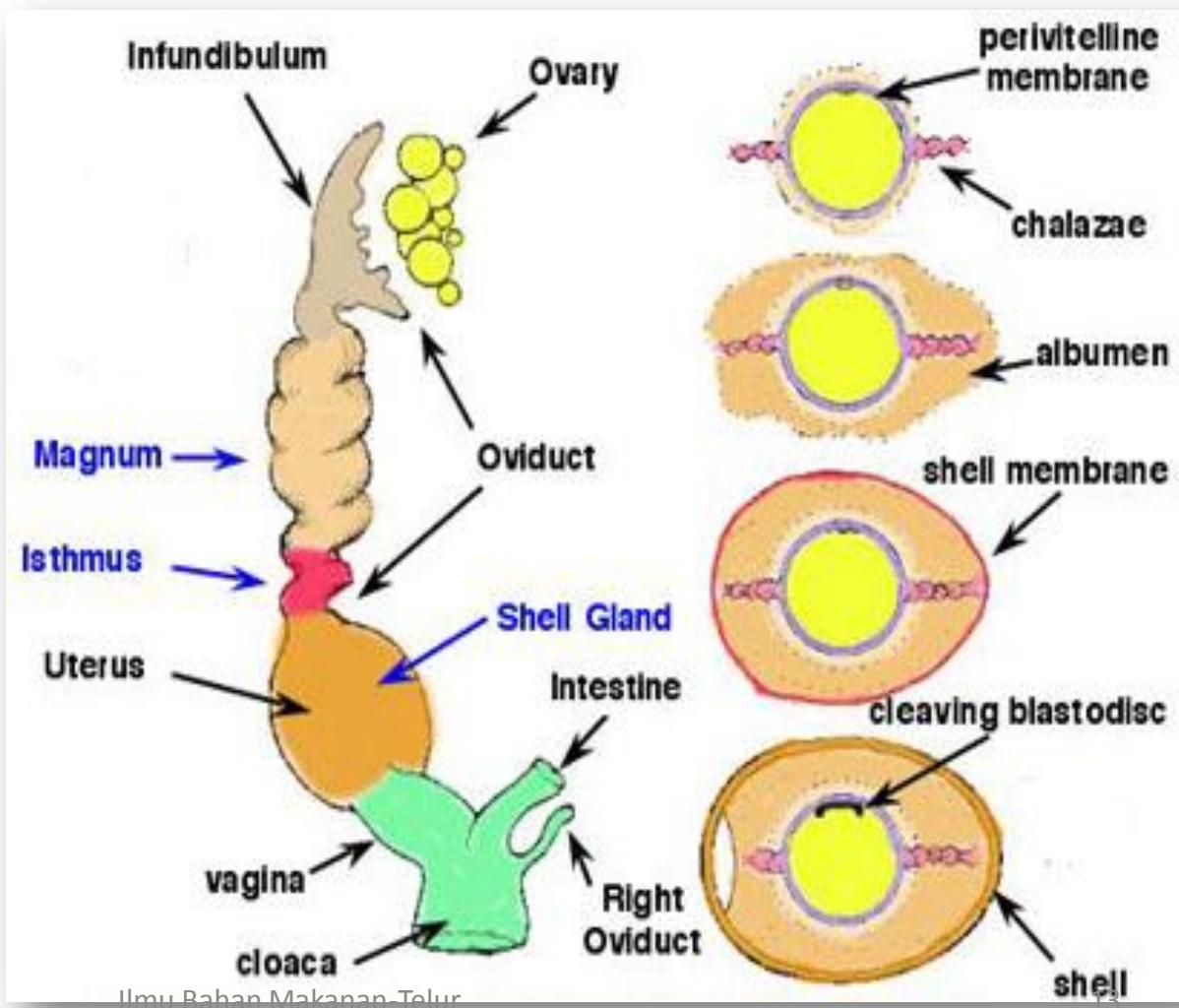
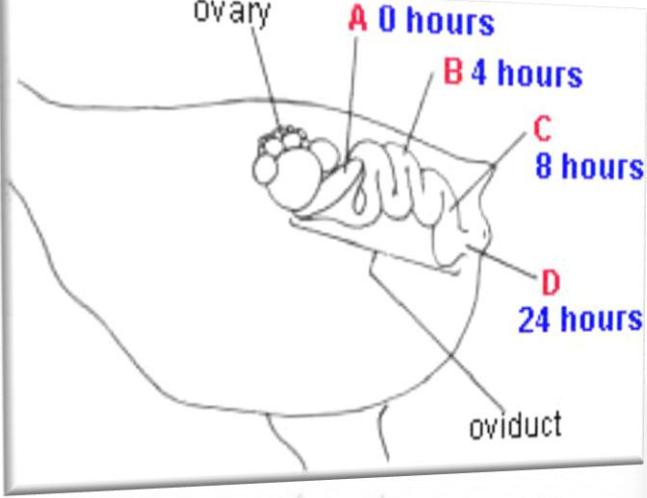
B OVIDUCT

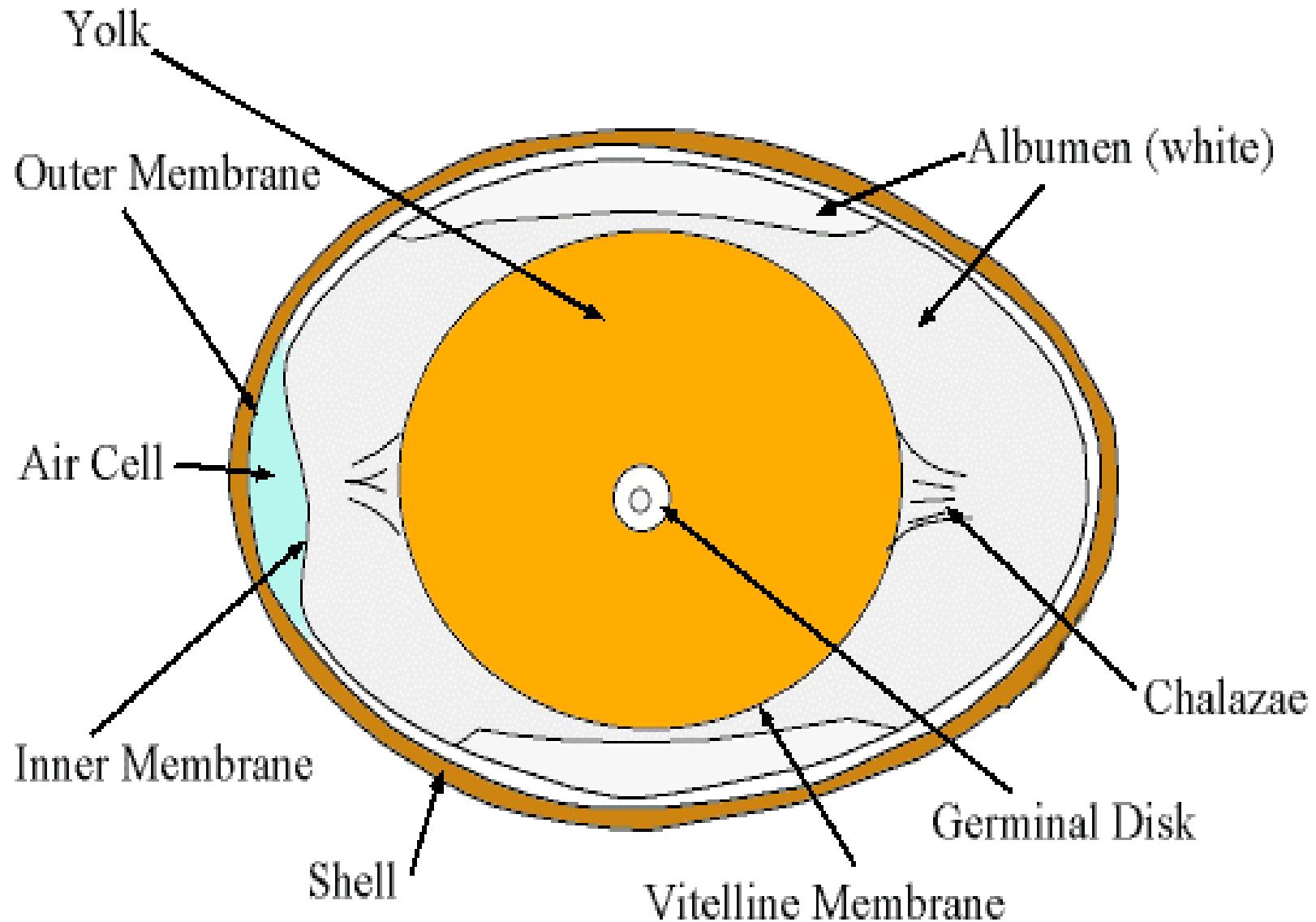
- 1 Infundibulum
- 2 Magnum
- 3 Isthmus
- 4 Uterus
- 5 Vagina.



PEMBENTUKAN TELUR

- SINAR MERAH MENGENAHI MATA (INDUK AYAM)
- MERANGSANG GLANDULA PITUITARI UNTUK SEKRESI FSH (FOLICLE STIMULATING HORMON)
- FSH MENGALIR KE OVARIUM
- RIBUAN SEL TELUR DIRANGSANG FSH UNTUK MEMBENTUK KANTONG BERISI KUNING TELUR
- KANTONG PECAH KUNING TELUR KELUAR (EVOLUSI)
- MASUK OVIDUCT
- MAGNUM (KUNING TELUR DISELIMUTI PUTIH TELUR YANG KENTAL (34 JAM) DENGAN GERAK SPIRAL MASUK KE ISTMUS :
- KUNING TERPLENTIR -> MEMBENTUK CHALAZA MASUK KE UTERUS :
- UTERUS KELUARKAN ALBUMIN ENCER DAN GARAM , JUGA MEMBENTUK CHALAZIFEROUS (10-21 JAM)
- TELUR MASUK KE VAGINA DAN KLOAKA
- SEMUANYA PERLU WAKTU 24 – 48 jam
- MULAI LAGI BUTUH WAKTU 30 MENIT





KULIT TELUR

- Pada permukaan (kutikula) ada protein keratin ~ rambut, kuku yang mengisi pori-pori, untuk kontrol bakteri, gas
- Lapisan bunga karang (calcareous) : protein serabut, lapisan kapur ($MgPO_4$, $CaCO_3$, $Mg CO_3$)
- Lapisan mamila, mrpk lapisan ke 3, tebal 1/3 seluruh bagian kulit . Ada lapisan luar, lapisan dalam, terbuat keratin

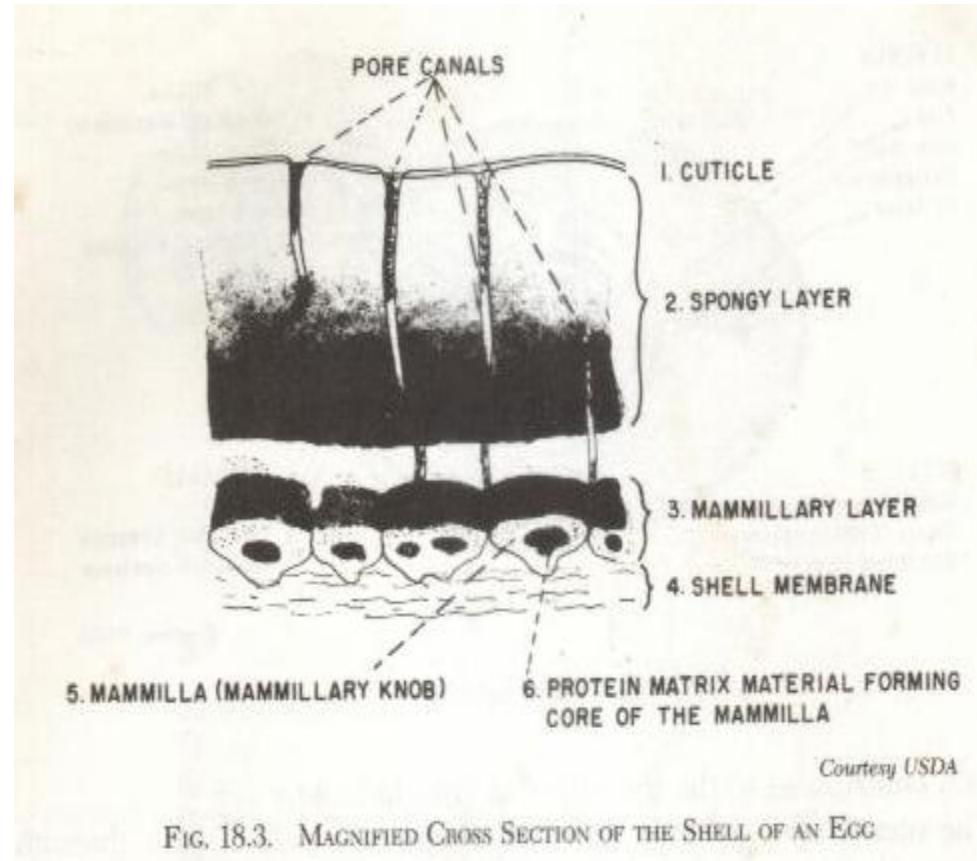


FIG. 18.3. MAGNIFIED CROSS SECTION OF THE SHELL OF AN EGG

Courtesy USDA

COMPOSITION

Shell

- Outer covering of egg, composed largely of calcium carbonate
- May be white or brown depending on breed of chicken.
- Color does not effect egg quality, cooking characteristics, nutritive value or shell thickness

Yolk

- Yellow portion of egg.
- Color varies with feed of the hen, but doesn't indicate nutritive content
- Major source of egg vitamins, minerals, and fat

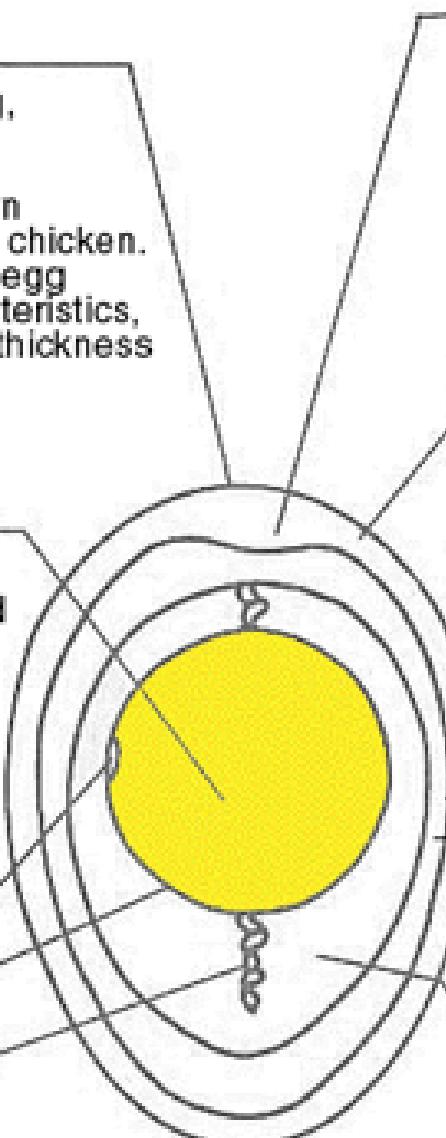
Germinal Disc

Vitelline (Yolk) Membrane

- Holds yolk contents

Chalazae

- Twisted, cordlike strands of egg white
- Anchor yolk in center of egg.
- Prominent chalazae indicated freshness



Air Cell

- Pocket of air formed at the large end of egg
- Caused by contraction of the contents during cooling after laying
- Increases in size as egg ages

Shell Membranes

- Two membranes-inner and outer shell membranes surround the albumen
- Provide protective barrier against bacterial penetration
- Air cell forms between these two membranes

Thin Albumen (White)

- Nearest to the shell.
- Spreads around thick white of high-quality egg

Thick Albumen (White)

- Major source of egg riboflavin and protein.
- Stands higher and spreads less in higher-grade eggs
- Thins and becomes indistinguishable from thin white in lower-grade eggs

Yolk (Ovum)

- *latebra*,
- *Germinal disc*,
- *concentric rings of yolk material*,
- *vitelline membrane* (a colorless membrane that surrounds and contains the yolk).
- The yolk constitutes approximately 31 % of the total weight of the egg



Yolk

- **Protein**

- Ovovitellin (3/4 bagian)
- Ovolivetin

- **Lemak**

- TG 65,5 %
- PL 28,3%
- Chol 5,2%

- **pH**

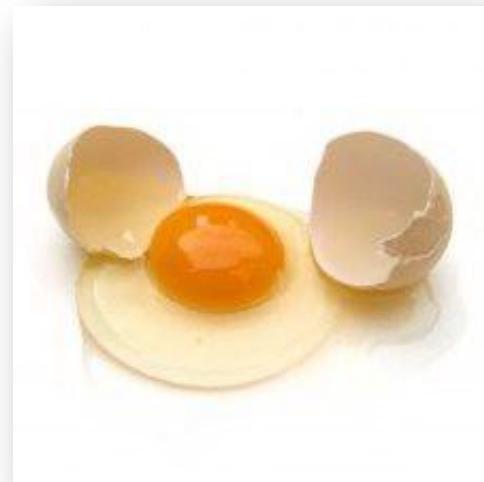
- Fresh 6,0
- Storage up to 7,0

- **Nutrient**

- Vitamin C
- Fe, P, S, Co, K, Cl, Mg, Ca, Mn

White (Albumen)

- The white consists of four distinct layers which together constitute about 58 percent of the weight of the egg.



Distinct layer	Component
Chalaziferous layer	<ul style="list-style-type: none"> •surrounds the yolk •continuous with the <i>chalazae</i> •very thin, but firm, layer of white •makes up 3 percent of the total white.
Inner thin layer	<ul style="list-style-type: none"> •surrounds the chalaziferous layer •comprises about 17 percent of the white
Firm or thick layer	<ul style="list-style-type: none"> •provides an envelope, or jacket, •holds the inner thin white and the yolk. •It adheres to the shell membrane at each end of the egg. •Approximately 57 percent of the white is firm white.
Outer thin layer	<ul style="list-style-type: none"> •inside the shell membranes, •accounts for about 23 percent of the total white

White (Albumin)

Thick albumin

- Ovomucin (Gives structure)
- Ovalbumin
- Conalbumin
- Ovoglobulin
- Ovomucoid

Thin Albumin

- Ovalbumin
- Conalbumin
- Ovoglobulin
- Ovomucoid

BLOOD SPOTS

- Blood or "meat" spots are occasionally found on an egg yolk.
- These tiny red or red-brown spots are not harmful.
- They are caused by the rupture of a blood vessel during formation of the egg.
- Blood spots do not indicate a fertilized egg.
- Candling reveals most blood spots and those eggs are removed, but even with electronic spotters, it is impossible to catch all of them.
- If desired, the spot can be removed with the tip of a clean knife prior to cooking. These eggs are safe to eat.

WHITE ROPEY THINGS" (CHALAZA)

- More noticeable the fresher an egg is, the two chalaza in an egg "anchor" or keep the yolk in the centre of the egg.
- They are safe to eat and generally "disappear" when an egg is cooked.
- However, if desired, they can be removed before cooking with the tip of a fork or knife.

KOMPOSISI KIMIA

TABLE 1. *Chemical composition of the egg.*

	Percent	Water	Protein	Fat	Ash
Whole egg	100	65.5	11.8	11.0	11.7
White	58	88.0	11.0	0.2	0.8
Yolk	31	48.0	17.5	32.5	2.0
		<i>Calcium carbonate</i>	<i>Magnesium carbonate</i>	<i>Calcium phosphate</i>	<i>Organic matter</i>
Shell	11	94.0	1.0	1.0	4.0

KOMPOSISI GIZI

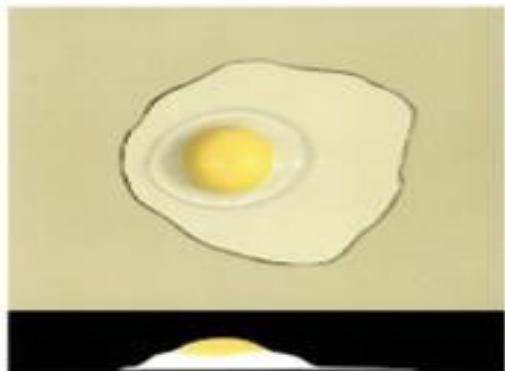
- 6-7 G PROTEIN, HIGHGEST QUALITY
- Mengandung semua asam amino-> standart reference
- 5-6 g lemak :
 - Unsaturated (sangat diinginkan)
 - Saturated
- < 0,4 g Karbohidrat
- Semua Vitamin ada kecuali vit C
- Kolesterol Tinggi

Table 16.3 Proteins in Egg Albumen

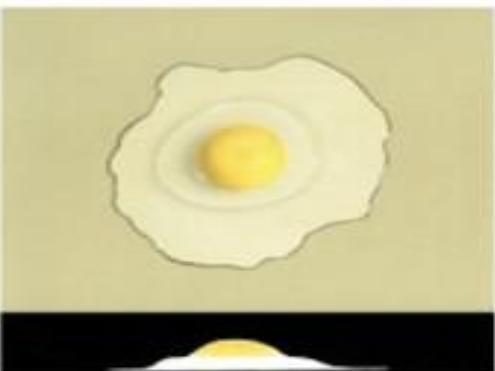
Protein	Relative Amount in Albumen (%)	Isoelectric Point	Molecular Weight	Characteristics
Ovalbumin	54	4.6	45,000	Phosphoglycoprotein
Conalbumin	13	6.6	80,000	Binds metals
Ovomucoid	11	3.9–4.3	28,000	Inhibits trypsin
Lysozyme (G_1 globulin)	3.5	10.7	14,600	Lyses some bacteria
G_2 globulin	4.0?	5.5	30,000–40,000	—
G_3 globulin	4.0?	5.8	?	—
Ovomucin	1.5	?	?	Sialoprotein
Flavoprotein	0.8	4.1	35,000	Binds riboflavin
Ovoglycoprotein	0.5?	3.9	24,000	Sialoprotein
Ovomacroglobulin	0.5	4.5–4.7	760,000–900,000	?
Ovoinhibitor	0.1	5.2	44,000	Inhibits some proteases
Avidin	0.05	9.5	53,000	Binds biotin

From Powrie, W. D. "Characteristics of edible fluids of animal origin: Eggs." In *Principles of Food Science I*. Fennema, O. R., ed. Dekker: New York, 1976, p. 665.

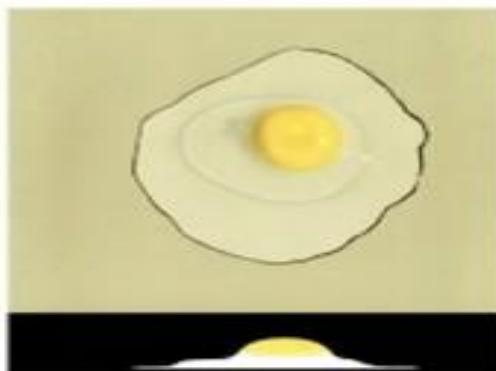
- **ALBUMIN** ; sebagian besar protein, gumpal panas
- **CONALBUMIN**; dapat berikatan dengan fe (merah) Co (kuning),
- **OVOMUCOID** : Glikoprotein (manosa, galaktosa, deoxyglukosa)
tahan denaturasi panas.
- **LYSOZYME** : Mampu melawan bakteri karena , mampu menghidrolisa polisakarida pada dinding sel bakteri
- **OVOMUCIN : PROTEIN** serat ada pada putih telur kental
konsentrasi 4 x dari putih telur encer tahan dnaturasi panas
- **AVIDIN** : protein yang mengikat biotin , tapi hilang kemampuannya oleh panas.



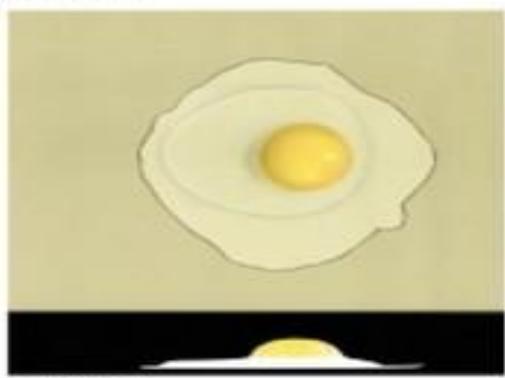
1. High "AA"



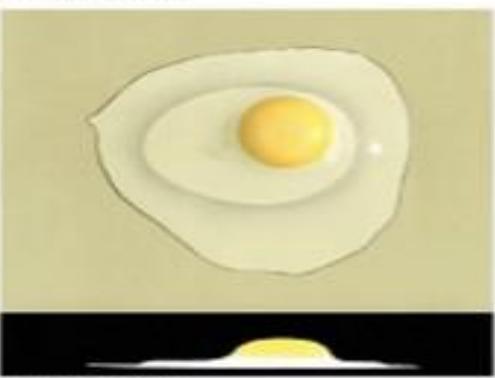
2. Average "AA"



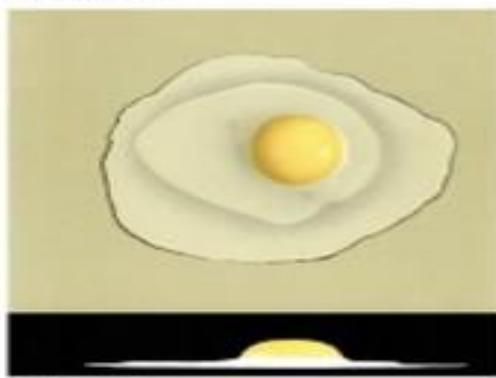
3. Low "AA"



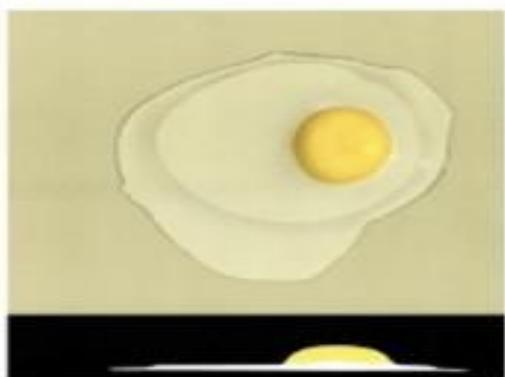
4. High "A"



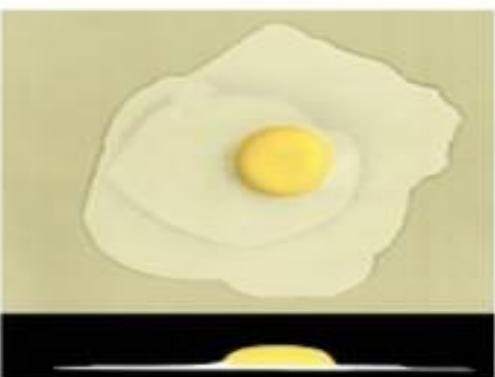
5. Average "A"



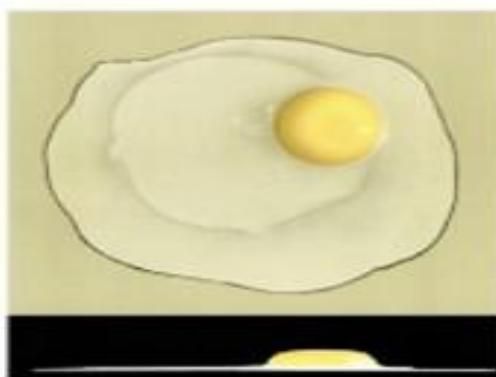
6. Low "A"



7. High "B"



8. Average "B"



9. Low "B"

A. BAGIAN DALAM (ISI)

- 1. RUANG UDARA**
- 2. KUNING TELUR**
- 3. PUTIH TELUR**

B. BAGIAN LUAR

- 1. KEBERSIHAN KULIT**
- 2. KONDISI KULIT**
- 3. WARNA KULIT**
- 4. BENTUK TELUR**
- 5. BERAT TELUR**

RUANG UDARA

**TELUR SEGAR → RUANG
UDARA < TELUR YG
LAMA.**

**MUTU AA →
KEDALAMAN RUANG
UDARA 0,3 Cm.**

MUTU A → 0,5 Cm.

MUTU B → > 0,5 Cm.

KUNING TELUR

**TELUR SEGAR → TDK
CACAT, BERSIH, TDK TDPT
PEMBULUH DARAH,
BERCAK DAGING ATAU
BERCAK DARAH**

PUTIH TELUR

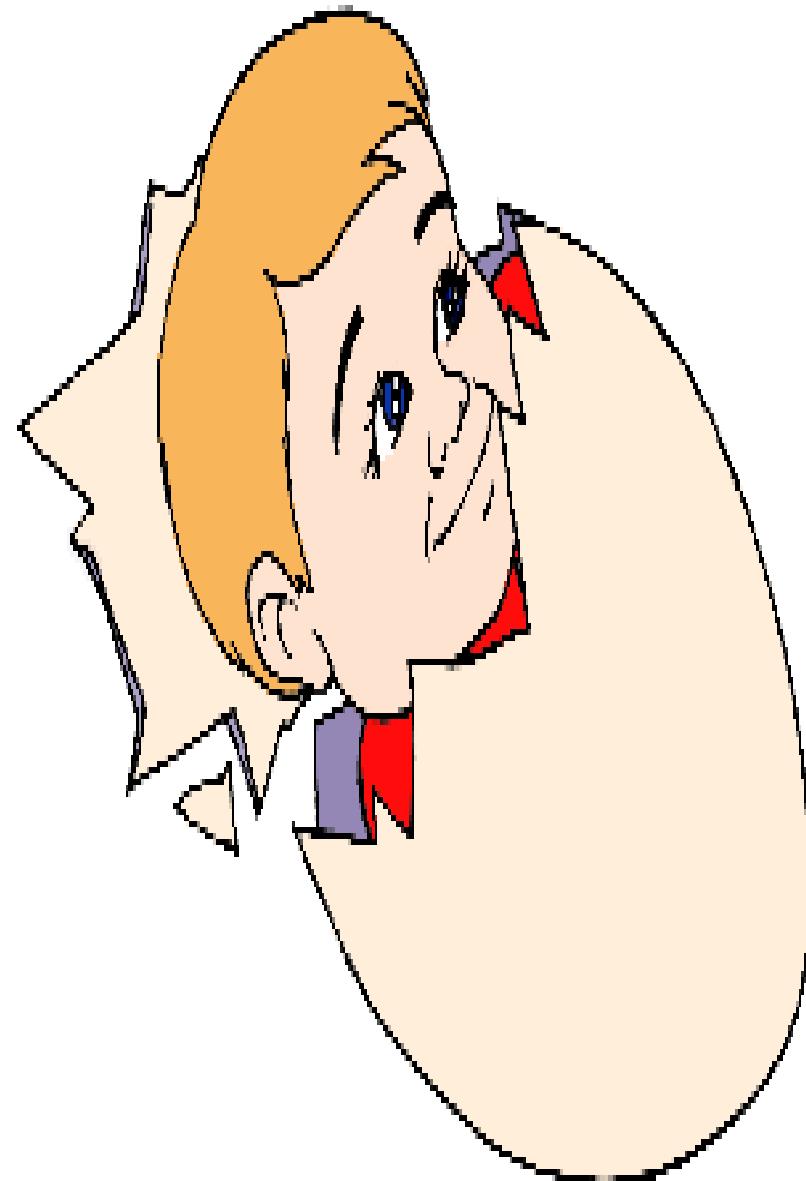
TEBAL, TERIKAT KUAT O/

MEMBRAN KALAZA.

MUTU AA → BEBAS DARI

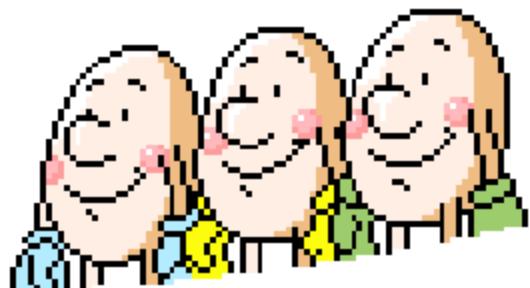
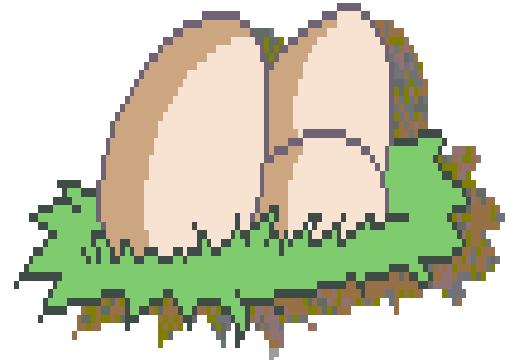
TITIK DAGING ATAU

DARAH



KEBERSIHAN KULIT TELUR

MUTU SEMAKIN BAIK JIKA KULIT
TELUR DLM KEADAAN BERSIH
DAN TIDAK TERDAPAT KOTORAN
APAPUN



KONDISI KULIT TELUR

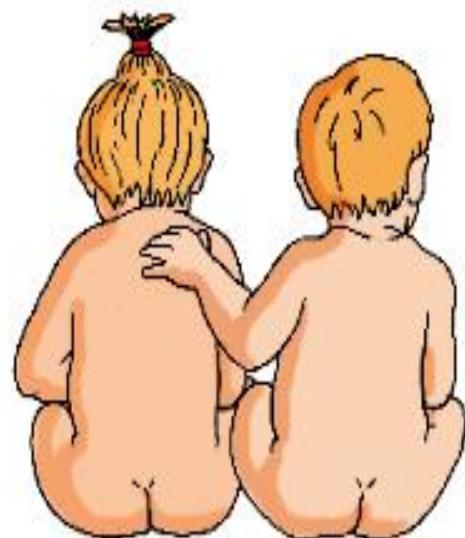
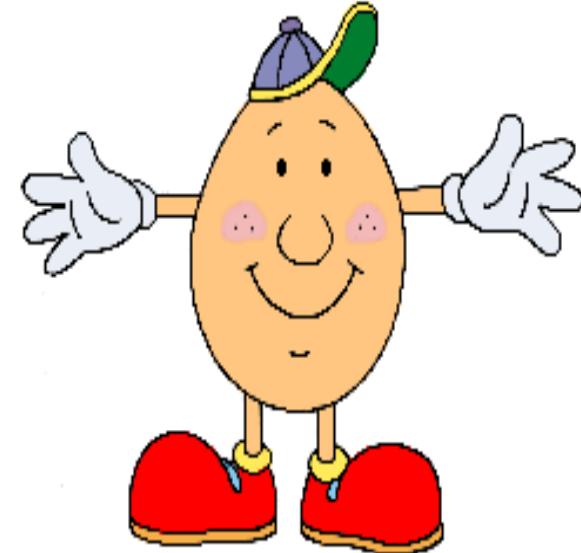
MUTU SEMAKIN BAIK JIKA
TEKSTUR KULITNYA HALUS DAN
KEADAAN KULITNYA UTUH DAN
TIDAK RETAK.

WARNA KULIT

**PUTIH DAN COKLAT (PIGMEN
CEPHORPYRIN).**

**COKLAT > TEBAL \pm 0,51 mm,
PUTIH 0,44 mm.**

**MUTU YG BERWARNA COKLAT
LEBIH BAIK.**



**BENTUK TELUR
PROPORTIONAL, TDK
BERBENJOL-BENJOL, TDK
TERLALU LONJONG, TDK
TERLALU BULAT**

BERAT TELUR

KLASIFIKASI	BERAT/BUTIR (gr)
JUMBO	68,5
SANGAT BESAR	61,4
BESAR	54,3
MEDIUM	47,2
KECIL	40,2
PEE WEE	< 40

PENGGOLONGAN BERDASARKAN UKURAN

UKURAN	BERAT (OZ)	MINIMUM/LUSIN (G)	BERAT/TELUR (G)
Jumbo	30	851	69
Ekstra besar	26	738	62
Besar	23	653	55
Medium	20	568	48
kecil	17	482	41

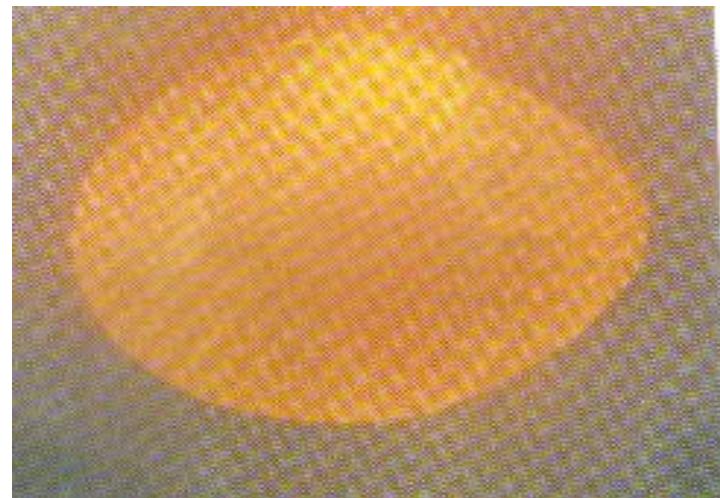
ABNORMALITAS / CACAT PADA TELUR

A. BAGIAN KULIT

RETAK KASAR → RETAK YG BESAR BAHKAN SAMPAI BERLUBANG → BAG KULIT LUAR DAN DALAM ADA YG PECAH.

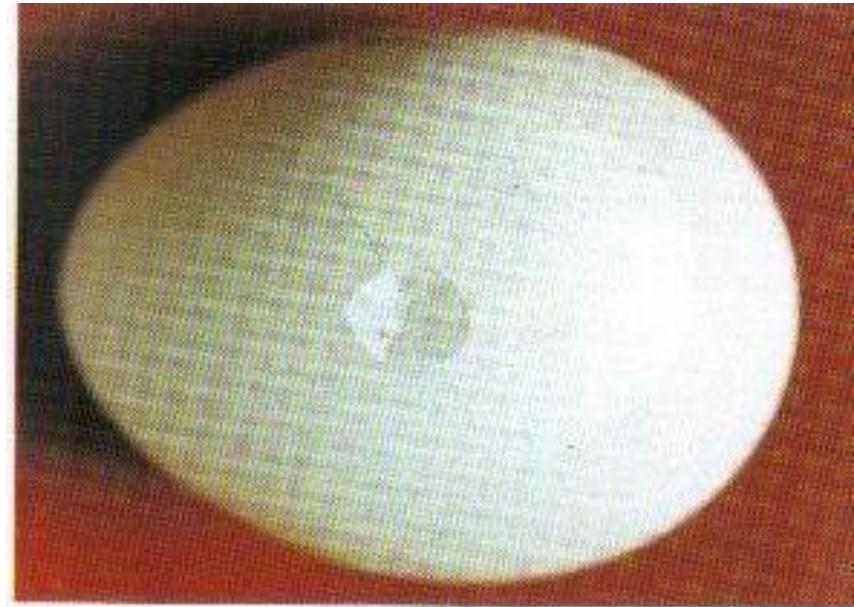


RETAK HALUS → RETAK SEHALUS RAMBUT, MEMANJANG. DIKETAHUI DENGAN PENEROPONG TELUR

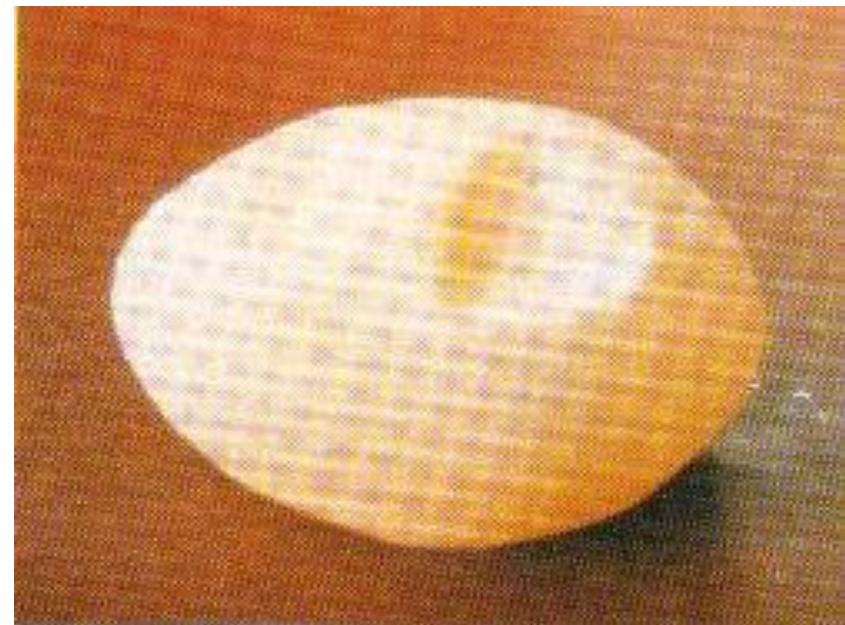


RETAK BINTANG

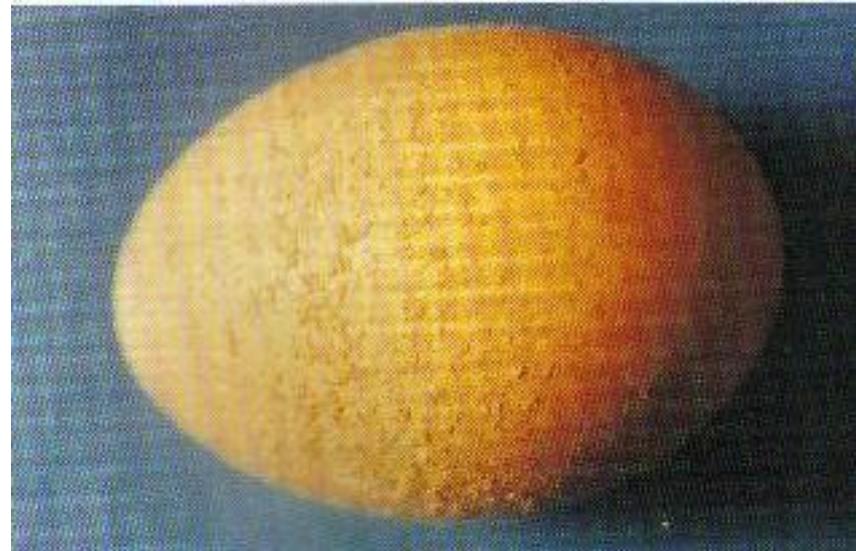
→**RETAK HALUS YG
MENYEBAR.**



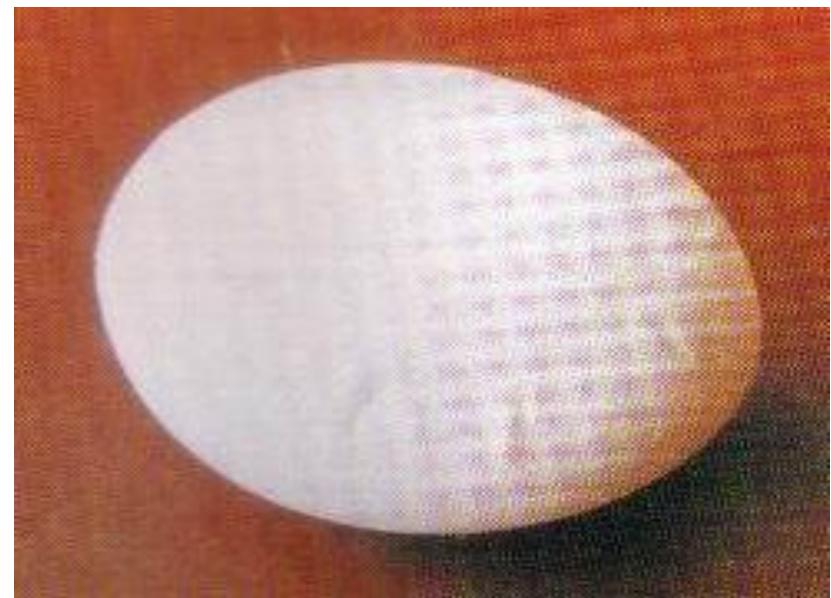
**KULIT TIPIS ATAU TANPA
KULIT TELUR → DARI
AYAM YG BARU MULAI
BERTELUR**



**KULIT KASAR SEPERTI
BERPASIR→ PADA AYAM
YG BARU MULAI
BERTELUR**



**KULIT MENGERUT
SEBELAH→ AYAM YG
BARU MULAI BERTELUR**

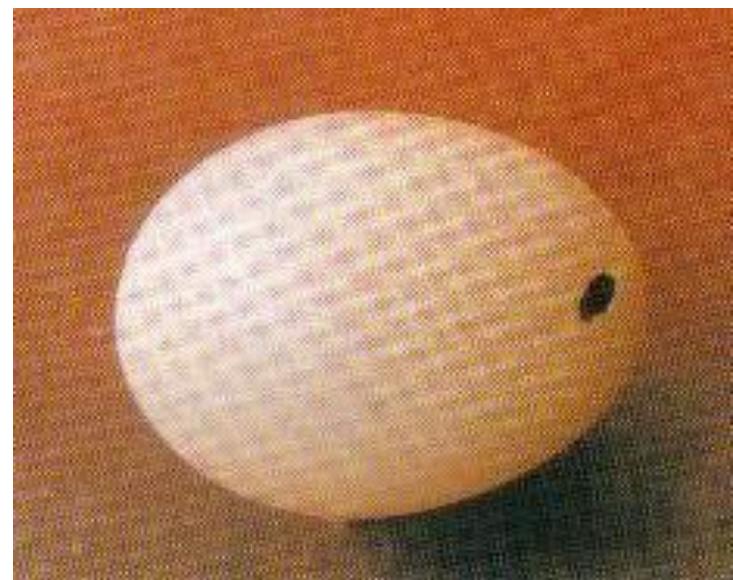


KULIT BERWARNA → BAG.

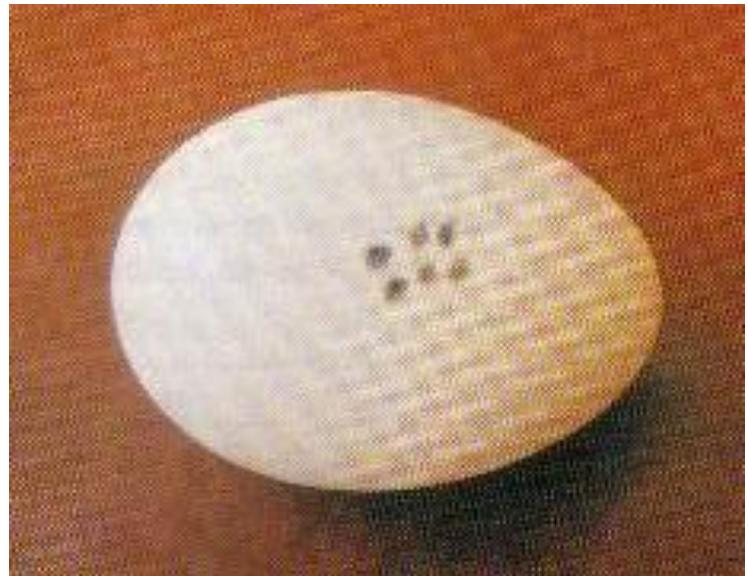
**KULIT KOTOR KARENA DARAH
& FESES.**



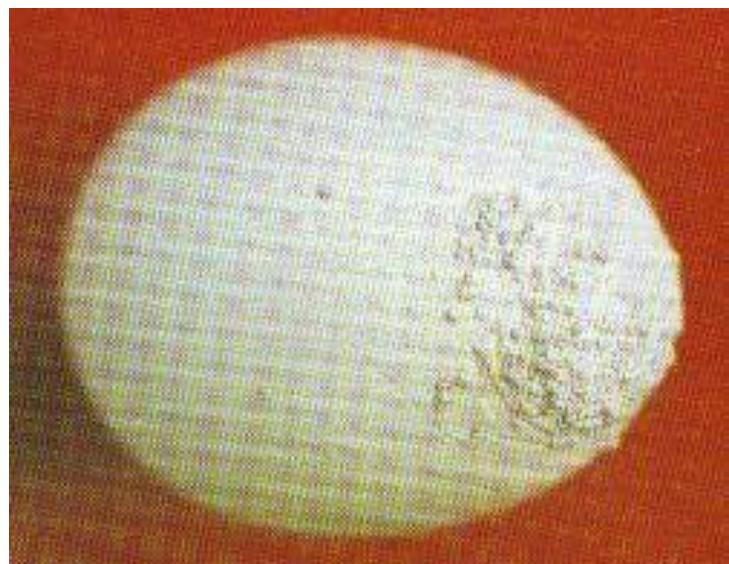
**KULIT BERLUBANG KECIL
KARENA UKURAN TERLALU
KECIL→MELUNCUR TERLALU
CEPAT DARI KANDANG).**



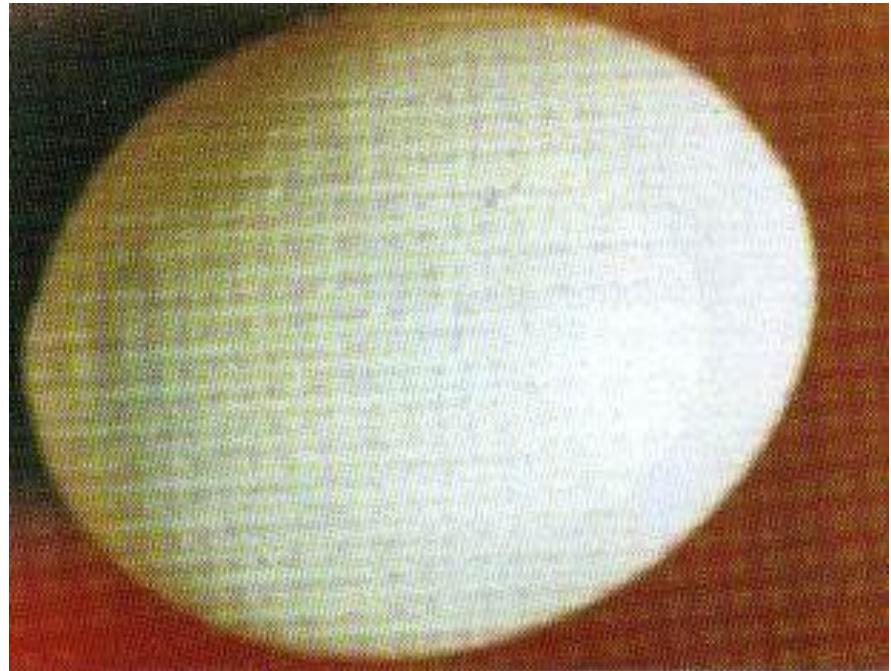
**TANDA LALAT → DI
TEMPAT TERNAK /
PENYIMPANAN TELUR
BANYAK LALAT.**



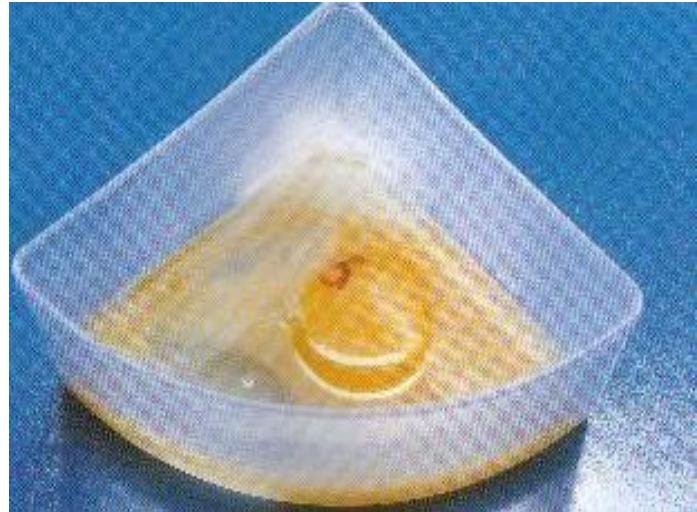
**JERAWAT / BISUL
(PIMPLES) → GUMPALAN
KECIL DARI Ca.**



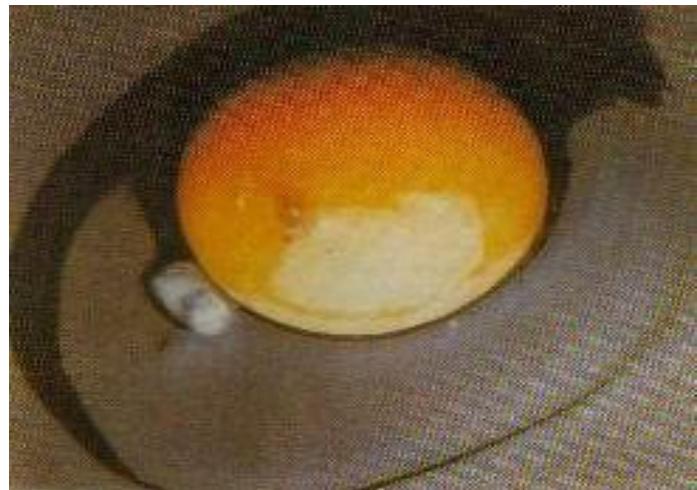
**TITIK-TITIK JERNIH PADA KULIT
(MOTTLED ATAU
GLASSY) → TITIK-TITIK JERNIH
SPT KACA DISERTAI KULIT TIPIS
& RAPUH. > JELAS DG
PENEROPONGAN.**



**BERCAK DARAH
(BLOOD
SPOT) → SETITIK
KECIL/SEJUMLAH
DARAH DI DALAM
TELUR.**

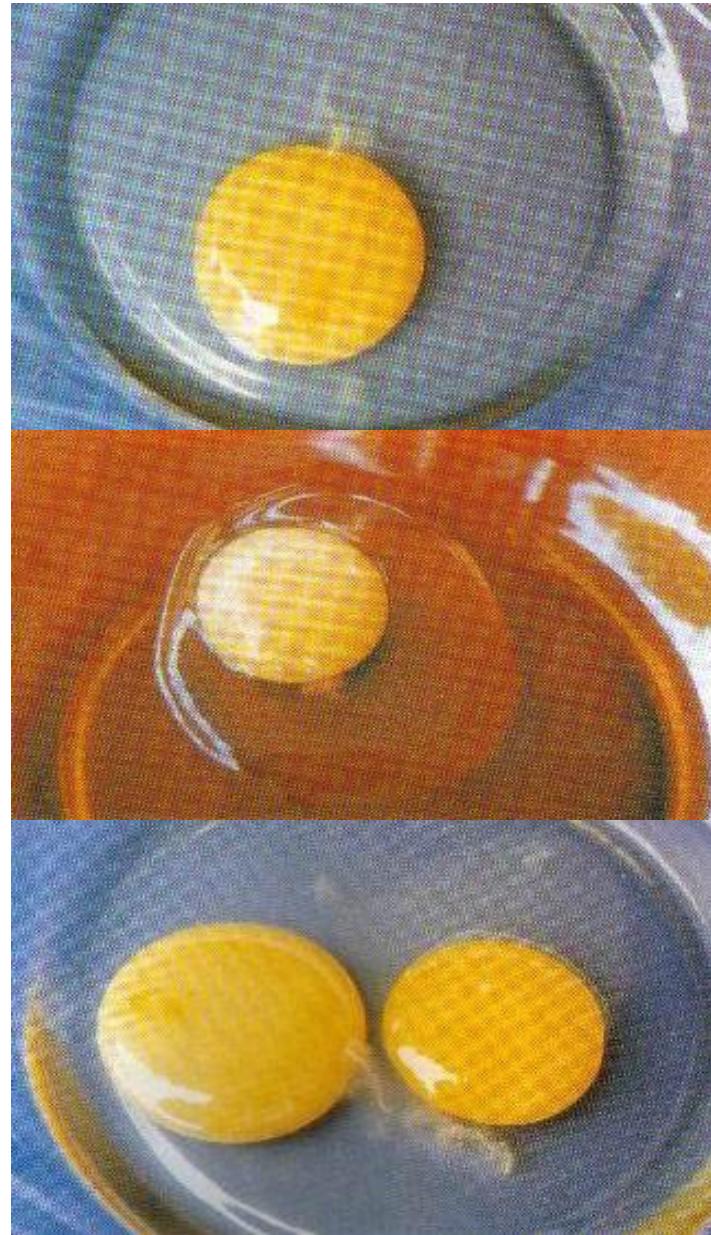


**BERCAK DAGING
(MEAT SPOT) →
KARENA JARINGAN
ORGAN TUBUH (0,5-3
mm)**

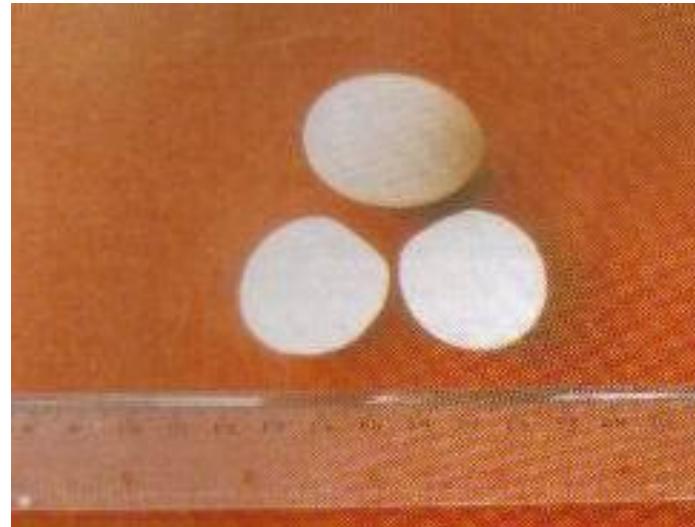


PUTIH TELUR
ENCER (WATERY
WHITES) → SEPERTI
AIR DAN
MENYEBAR.

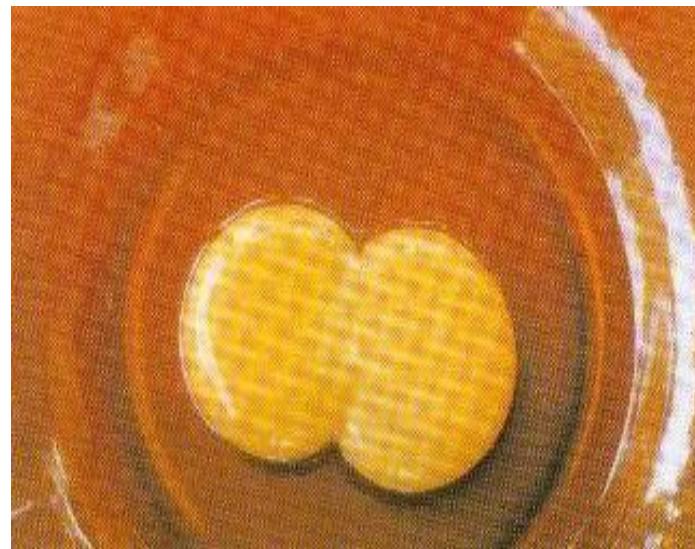
KUNING TELUR
PUCAT →
KAROTENOID



**TELUR TANPA KUNING
TELUR→ KARENA
KEKAGETAN AYAM.**



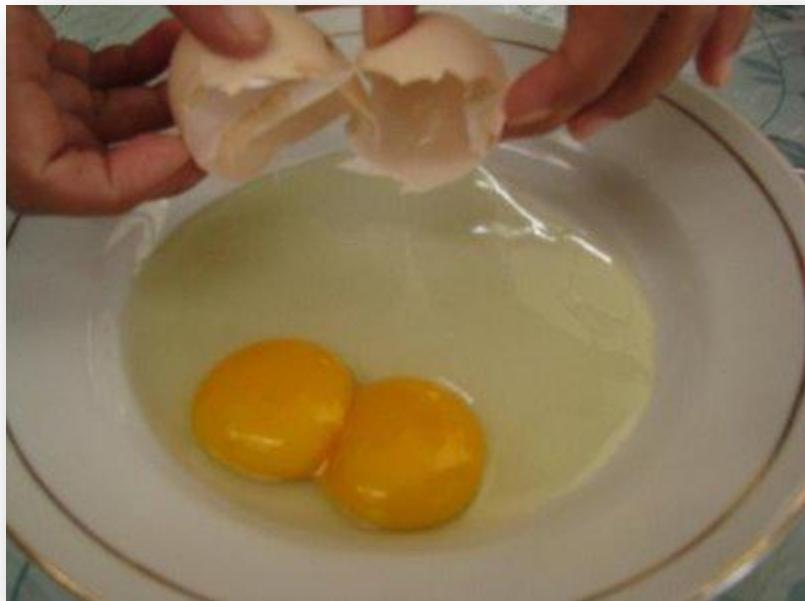
**TELUR DG. 2 KUNING
TELUR (TELUR
JUMBO)→PADA
AYAM YG BARU
MULAI BERTELUR.**



**TELUR DIDALAM
TELUR→ KARENA
KEKAGETAN AYAM →
SUARA ATAUPUN
BENDA ASING.**



Penyimpangan Telur



Penyimpangan Telur



Penyimpangan Telur

